

$$\begin{aligned}
 & x^2 + y^2 + 4x + 6y = 2 \\
 & x^2 + 4x + \underline{4} + y^2 + 6y + \underline{9} = 2 + \underline{4} + \underline{9} \\
 & (x+2)^2 + (y+3)^2 = 15 \quad C(h, k) \\
 & \rightarrow (x-h)^2 + (y-k)^2 = r^2 \\
 & C(-2, -3) \quad r = \sqrt{15}
 \end{aligned}$$

$$x^2 + y^2 + 3x - 4y = 3$$

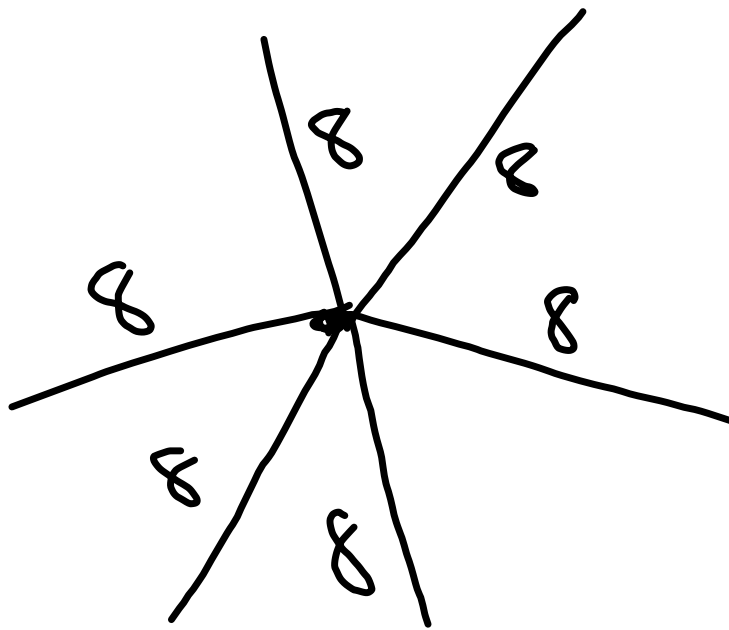
$$x^2 + 3x + \frac{9}{4} + y^2 - 4y + 4 = 3 + \frac{9}{4} + 4$$

$$\left(x + \frac{3}{2}\right)^2 + (y - 2)^2 = 7 + \frac{9}{4}$$

$$\left(x + \frac{3}{2}\right)^2 + (y - 2)^2 = \frac{37}{4} \quad \frac{28}{4} + \frac{9}{4}$$

$$C\left(-\frac{3}{2}, 2\right) \quad r = \sqrt{\frac{37}{4}} \text{ or } \frac{\sqrt{37}}{2}$$

$$x^2 + y^2 - 4y + 8y + 25 = 0$$



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No - graph

radius must be positive

$$(x-3)^2 + (y+4)^2 = 0$$

Point

$$C(-2, -5) \quad P(-2, 3)$$

Find the equation of circle. Find the equation of the tangent line to the circle at P.

$CL-2,5) \quad P(1,4)$

P.88

16, 24, 34, 38, 40